



1-1966

Bulletin of the Massachusetts Archaeological Society, Vol. 27, No. 2

Massachusetts Archaeological Society

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**BULLETIN OF THE
MASSACHUSETTS ARCHAEOLOGICAL
SOCIETY**

VOL. 27

NO. 2

JANUARY, 1966



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**PUBLISHED BY THE
MASSACHUSETTS ARCHAEOLOGICAL SOCIETY, INC.**

SOCIETY OFFICE, Bronson Museum, 8 No. Main Street, Attleboro, Mass.

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MASSACHUSETTS ARCHAEOLOGICAL SOCIETY BULLETIN, published in four Numbers of one Volume each year, commencing in October.

Price this issue \$.75

(Subscription by membership in the Society: \$3.00)

Note: Address all requests concerning membership to the Secretary; all orders for back Bulletin numbers (4 for \$1.00 to members) to the Editor; and mail Society dues to the Financial Secretary. Exception: Classification No., Vol. 25, #1 — \$1.00 to members, \$1.50 to non-members.

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The Museum includes exhibits of artifacts and seven dioramas portraying man's prehistoric occupation of New England. The displays are arranged so as to show man's development through four culture stages, from early post glacial times.

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THE HORNE HILL SOAPSTONE QUARRY

17

WILLIAM S. FOWLER

Besides this site, the writer has participated in the excavation of seven other steatite stone bowl quarries, located in Massachusetts, Rhode Island, Connecticut, and Pennsylvania. His investigation has extended through eight seasons work, resulting in the discovery and classification of a varied list of specialized tools used by the quarriers in pecking and scraping into shape the products of their industry.

Located in Bramanville, a suburb of Millbury, Massachusetts, a steep hill faced with stone outcrops and huge granite boulders rises abruptly from the main road of the town. Nearby to the south flows Singletary stream, headwaters of the Blackstone River, which empties into Narragansett Bay. This water course, doubtless would have afforded travel by dugout in early days, and provided a convenient way of reaching the quarry. This is situated about half way up the hill, 130 feet above the highway. At this spot in aboriginal times occurred outcrops of steatite, which have been worked away in past ages by the workmen of the quarry. This quarrying has left a huge cavity extending back into the precipitous cliff to form what appears as a sort of cave. Quarry tailings, made up of man-made steatite dust and chips, cover the immediate area. They extend in depth to about 8 feet, burying stone tools and semi-finished steatite products left behind by the quarriers.

The property has belonged to the Horne family for years, and the youth of each generation have been intrigued to explore the cavern up the hill. In more recent days, the adjoining area was leveled to provide foundations for a greenhouse, which stood on the spot for a number of years. This has since been removed, but its former presence has caused the top 2 feet of quarry waste to become disturbed. Other previous disturbances have also occurred, resulting from several superficial excavations by amateur and professional explorers. On these occasions a few holes were excavated, and in one instance a trench was dug across the front of the cavernous opening. Dr. Putnam of Harvard University was one of those early excavators, who located certain stone tools and semi-finished steatite products. It is reported that at least one well worked bowl with lugs was recovered, probably in a semi-finished condition. However, beyond this and a brief statement of facts by Putnam, nothing has been learned concerning the quarrying of this site, as related to when and how it was operated, and as to the identity of the quarriers. During the past quarter century, much has been learned from extensive excavations carried on at stone bowl quarries in other parts of New England. Of these, reports have appeared in

print of operations at Westfield, Wilbraham, Oaklawn, Ragged Mountain, and Dolly Bond. Since the Horne Hill quarry's evidence has much in common with that from the other sites, there is every reason to believe that it represents just one more link in a widespread industrial activity of stone age times. How extensive this productive effort was may be gleaned from the frequent appearance of aboriginal steatite quarries throughout the Appalachians, where many steatite outcrops occur. In New England, alone, more than twenty quarries have been identified and excavated with quite similar results. This seems to establish proof of the importance of the industry in the economy of some early age. In this report, further evidence is revealed, which not only confirms past discoveries, but adds much that is new about the stone bowl industry. This is not derived from the remains of finished products of the Horne Hill quarriers, since evidence both here and elsewhere indicates the finishing to have been done at their home camp sites, to which the steatite objects were brought in a semi-finished condition. Therefore, we must be satisfied to examine whole or broken fragments in various stages of partial development, which appear in the waste of the quarry. Further, the operational methods and working techniques, which produced the quarry products, are to be found in a study of the stone tools. These had either become worn out, lost, or left behind when the quarry closed down.

In June of 1957, exploratory test digging at the Horne Hill site revealed good evidence of quarry remains. Based upon these favorable findings, permission to excavate the quarry and retain all recovered artifacts for study was generously granted by William D. Horne to the W. Elmer Ekblaw Chapter of the Massachusetts Archaeological Society; the property at that time was owned by the William E. Horne Estate. In behalf of the Chapter, the writer wishes to take this opportunity to express his appreciation for this grant, which has made this report possible. The excavation that ensued was conducted in an orderly and scientific manner, the results of which seem to amply justify the confidence placed in the Ekblaw Chapter. Work continued for a number of seasons, finally terminating on October 20, 1962. Recovered artifacts that could be identified were recorded with depth in inches noted for each. However, it soon became apparent that depth alone was not an important factor, due to the overlapping backfill from early quarrying. In spite of this, certain features were apparently undisturbed, particularly at low levels, where they had

become buried by waste from subsequent quarrying.

EXCAVATION METHODS

A relatively narrow flat area on the side of Horne Hill, directly in front of the cavernous opening, was laid out by the grid method in 5 foot squares. Artifacts were recorded on printed forms as to depth in inches from the top of the ground. Ultimately, these reports were transferred to a master chart of the dig, with a separate sheet provided for each succeeding one foot level. A total depth of 8 feet was reached, at which depth remains of a worked steatite outcrop were encountered. On this were found the partial pecked-out contours of 3 bowl forms. They are described in some detail in the special features section.

As previously mentioned, the first 2 feet of the area dug had been disturbed by recent building of the greenhouse. This left 6 feet of fill to be dug, which contained largely undisturbed quarry litter of stone bowl making. Commenting on the distribution of tool traits through this quarry accumulation, it may be well to note here that there was no appreciable difference from top to bottom. This would seem to indicate no change in manufacturing techniques over the many years of quarrying. The area finally excavated covered about 684 square feet, which included excavation along the face of the ledge into one or two small rock shelters. Here, overhanging slabs of rock had fallen to bury quarry remains. After these were removed, stone tools and worked steatite were found lying below. They exhibited the same characteristics as those appearing throughout the main section of the site.

It had been hoped that domestic stone implements would appear in these small rock shelters to support the belief that they had been used as living abodes by the quarriers. However, nothing but the usual quarry remains were encountered. This seems to support the hypothesis that steatite outcrops had either been quarried away at these places, or that the workmen had used the shelters for workshops.

INDUSTRIAL TOOLS

Perhaps, the most conspicuous quarry remains found in the tailings were stone tools, of which more than 400 well-defined specimens — many broken — were recovered. Besides these, were many more ill-defined ones, which could not be identified. The former have been classified into type groups. Those selected for the illustrations are from the better formed specimens, and are held to be representative. The nomenclature used is that reported by the Massachusetts Archaeological Society in their recent stone im-

plement classification Bulletin, Vol. 25, No. 1. While not all possible tool types are represented in the recoveries, many are. For those that are absent, crude unworked flakes which frequently appeared may have taken their place.

To judge from their various shapes, all recognizable tools seem to have been expressly made for performing specialized work, and were not the result of any sudden haphazard development. It must have required generations of trial and error, before the several standard types evolved and were adopted, not only in New England quarries, but in those to the south as well. Because of their specialized functions, a study of them becomes desirable for a better understanding of how the work of bowl making was carried on.

End Pick (Figs. 1, 2). This implement was a most useful and popular tool, to judge from its high frequency not only here, but at all other quarries as well. At this site it appears in small and large sizes, and is made of tough stone materials, some of which outcrop in the quarry. A few picks are of basalt, which came from rock deposits at a distance. Small sizes were used for finishing, while large ones were for primary quarrying purposes, and for preliminary pecking out of bowl forms; tiny 1-2" long picks were absent. Some of the larger picks are side-notched by chipping, some by pecking. This signifies probable hafting of such specimens. Chipped side-notched specimen (Fig. 2, #1) has traits suggestive of attachment of a handle from the side, like an ax. Another example, (Fig. 2, #3) has pecked-out side-notching, but is so thick that it doubtless was hafted in a similar fashion to that of an adz blade. For the most part, however, End picks have no side notching, instead, have their sharp basal edges bumped off, as if to provide a suitable handle for hand use.

In the making of a pick, an elongated block of stone was worked down to a point at one end; occasionally at both ends. At times, a corner of the block, instead of the end was pointed, apparently to provide an implement to be operated by wrist motion, rather than by a direct thrust from the arm; is described as a Corner pick. In rare cases, as shown (Fig. 2, #2), a Corner pick may be double bitted with pick points at right angles to each other, to provide a most useful hand implement. Often, some picks seem to have been quickly made from rough unworked stone blocks; are ill-defined, but were no doubt just as efficient as well-formed specimens.

Chisel (Fig. 2, #4). This is no more than an End pick with its bit shaped — usually by grinding — into

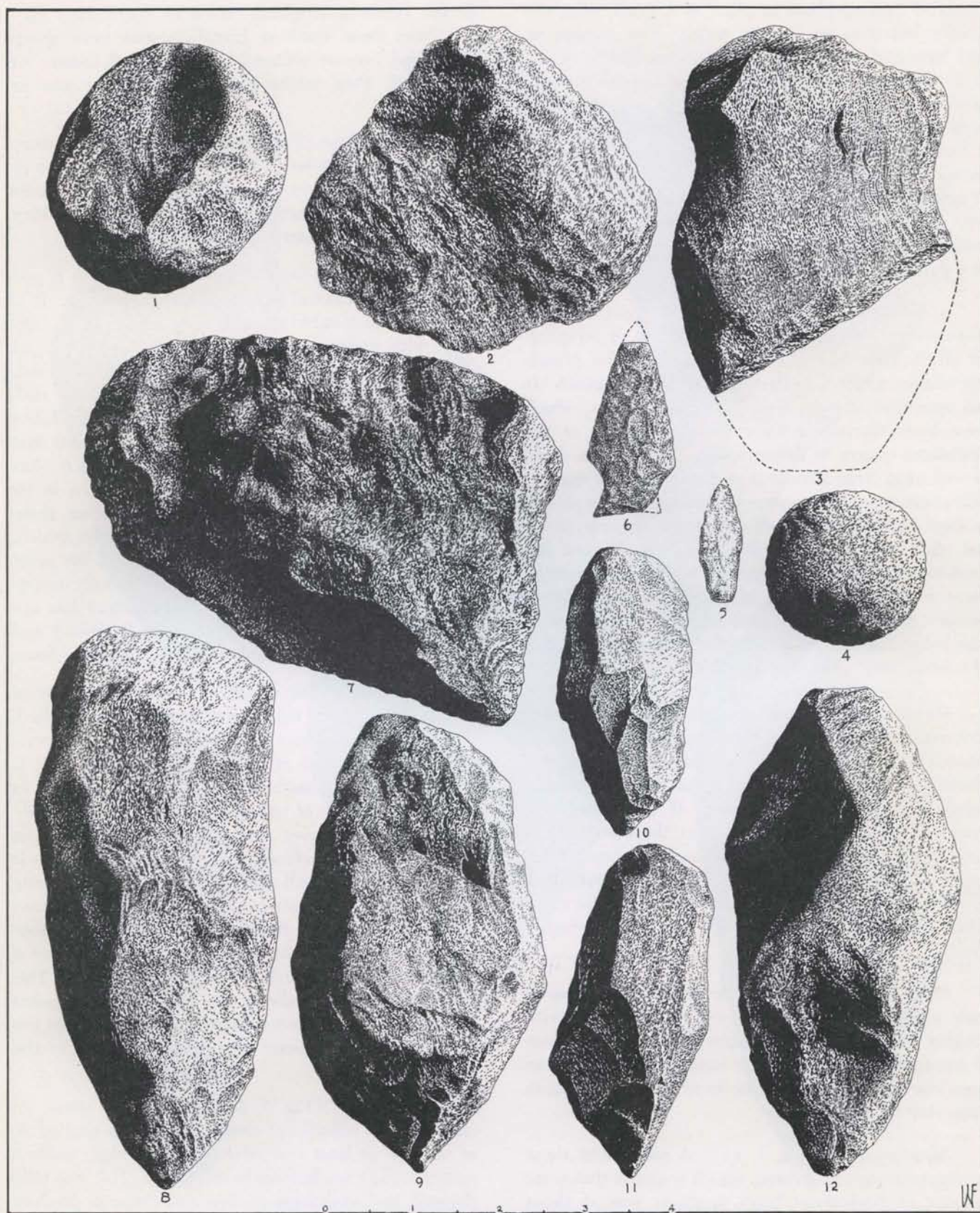


Fig. 1. MISCELLANEOUS RECOVERIES, Horne Hill Quarry. 1, Abradingstone; 2, 7, Abrading-Scraper; 3, Full Grooved Ax; 4, Hammerstone; 5, Small Stem Point; 6, Eared #3 Point; 8-12, End Pick.

a narrow cutting blade in place of a point, which is usually less than an inch in width. This implement may have had a specialized function, as will be shown in a following section, but does not appear to have been in as general use as the pick. In fact, it seldom occurs in New England quarries. In instances in which it has appeared, as at this quarry where it seems to have been used as a hand implement, it is well made of igneous stone. Most always, it is found in such a way as to suggest that it was a prized possession of some worker, who carried it to and from the quarry as a part of his personal equipment.

Abrading-Scraper (Fig. 1, #2, 7). Apart from the all-important process of pecking was that of scraping. Of all the tools used in this kind of work, the Abrading-scraper appears to have had wide acceptance. It has appeared at most New England quarries, which have been thoroughly excavated, as well as at the Christiana quarry in Pennsylvania. It occurs in small as well as in large sizes, but at the Horne Hill quarry, only medium and large sizes are present. Made always of hard igneous stone materials, it is chipped from a flat spall, oval or oblong in shape. Usually, one unworked edge serves as a handle, while the remaining three edges are coarsely, bi-facially chipped. Occasionally, a specimen may have all edges chipped, with one being rounded to fit into the bottom inside edge of a bowl, while scraping (exhibit #7).

Many medium sized igneous stone flakes were recovered, which showed no perceptible retouching. Because of the absence of well-shaped scrapers of a small size, it is probable that these flakes may have served the purpose of scraping. If so, specialized, carefully made small tools, such as the Hand gouge and Shaver, doubtless were replaced by them. Such crude tools would have been useful in the making of small products, such as drinking cups and paint cups, and might have worked as well as specially shaped tools.

Maul (Not illustrated). Several of these quarry tools appeared. They are heavy stone blocks with roughly battered ends, and show signs in some cases of having been hafted. Their function seems to have been one of bumping off chunks of stone outcrops in quarrying for steatite.

Abradingstone (Fig. 1, #1). A number of these implements were recovered, which suggests that some refining of pecked-out bowl products was at times carried on at the quarry. This tool is made from coarse grained stones, such a pegmatite, and may assume any rounded shape, convenient for hand use.

At the Horne Hill quarry, some of these tools may first have been used as Hammerstones until sharp edges had become reduced to many small facets. At this point, they might have continued in use as abraders.

Hammerstone (Fig. 1, #4). As at any site, more or less rounded stones appeared, which show signs of battered wear all over, or at one or more spots. These stones provide evidence to show that some tool making took place at the quarry by percussion flaking.

Spiked Tailing-breaker (Fig. 3, #1). This is one of the tailing-removal tools found at the quarry. It is made of semi-durable stone, granite schist, which outcrops with steatite here, as well as at most stone bowl quarries. This implement consists of an elongated slab of stone, worked down to a rough point at one end. Usually, it appears to have been held in the hand, but occasionally, as illustrated, side-notching suggests that it was hafted. This site specimen, apparently, has never been used, as it shows no wear and is in its original well-pointed, unworn form. More often, these tools are found in a worn-out condition, in which, through constant breakage and reworking of the point a shortened light-weight tool results, scarcely recognizable as a tailing-breaker. This implement has appeared at all quarries, except those at Westfield and Wilbraham, where it is replaced by a triangular form.

Triangular Tailing-breaker (Fig. 3, #2). Made of semi-durable stone, this tool must have been hafted, it would seem, in order to make it usable. One specimen, only, appeared at the Horne Hill quarry. It is made of impure granite, and exhibits similar traits to others in this class of tailing-breakers. Of a relatively large size, its all-over shape is triangular with one extremity pointed, which serves as the bit. Its base is thick, and has a well-worked, wide groove running obliquely crosswise between its basal ends. This shows wear, as does the bit. Because of the groove, the inference seems to be that it served as a socket for a handle, one end of which was laced to the blade. This would have provided the worker with a haft somewhat similar to that of a modern hand cultivator, except the blade would have been at an obtuse angle to the handle.

Hand Spade (Fig. 3, #3). Almost any stone, including even chlorite at times, which had spalled so as to form at least one relatively thin edge, made a suitable rough spade-form to start with. This was then chipped, and sometimes pecked into shape to produce at one edge a thinned blade. Usually, one thick edge is left unworked, which becomes the handle. The blade is sometimes hollowed a trifle by pecking to

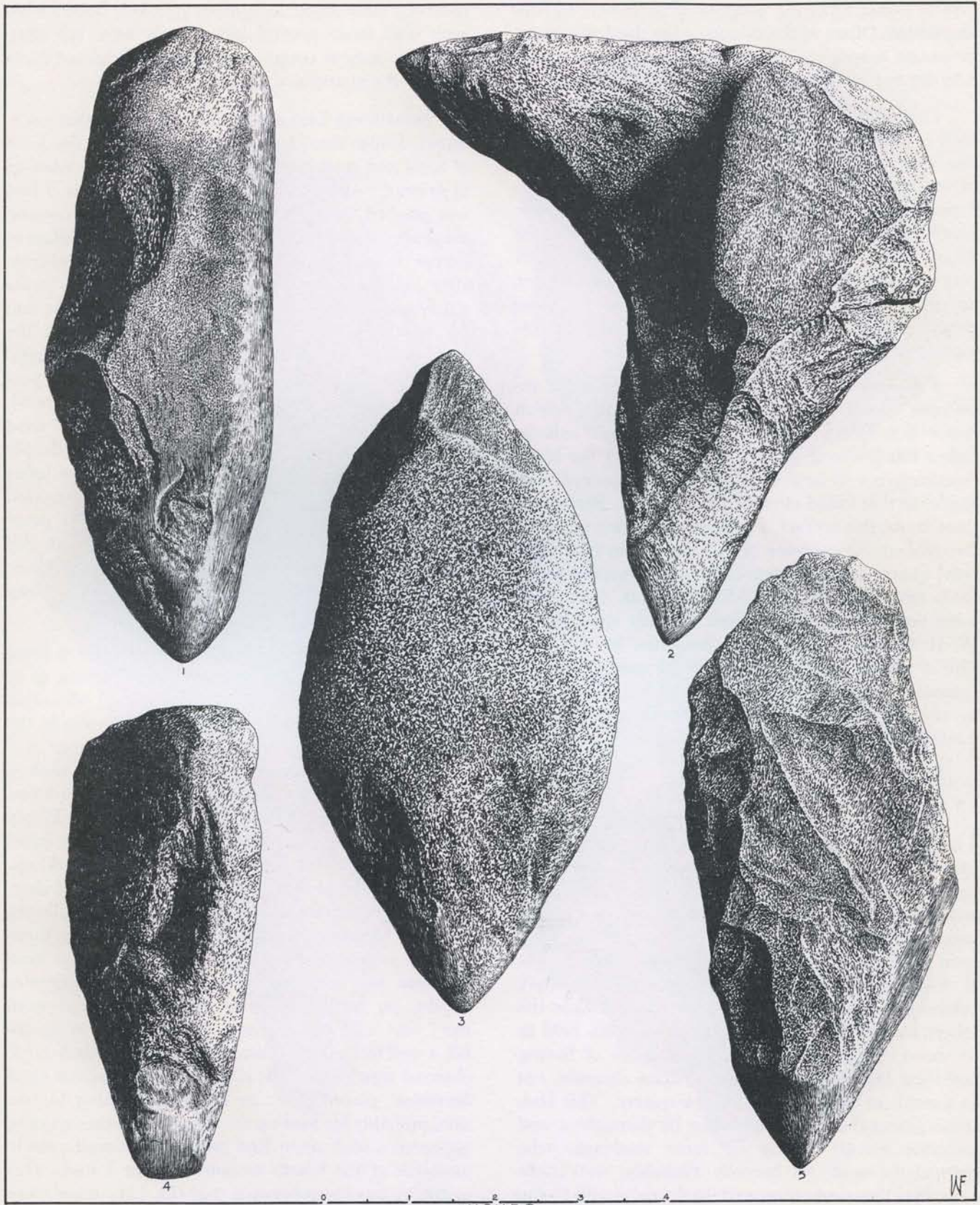


Fig. 2. CACHE OF TOOLS, Horne Hill Quarry. 1,3,5, End Pick; 2, Corner Pick, double bitted; 4, Chisel.

give it better scooping properties, as shown by the illustration. Often, at the thinned edge there is a slight projection something like the bit of a spoon, to enable it to dig more effectively into the loosened tailings.

Projectile Points (Fig. 1, #5, 6). Domestic traits, such as projectile points, usually are scarce at quarries, except in cases where living quarters were set up in, or nearby the work area. At the Horne Hill quarry, 2 points, only, were recovered. They consist of the Small Stem type of white quartz (#5), and Eared #3 of felsite (#6). The latter is a well established diagnostic of the Late Archaic, while the former first appears in the Late Archaic zone at excavated sites, then overlaps into the Ceramic zone, where its frequency becomes sharply reduced.

Full Grooved Ax (Fig. 1, #3). Among the recoveries appears this broken implement base, which has well-defined pecked-out side grooves for hafting. Below this grooving on one side, enough of the blade remains to reveal large flaking somewhat pecked-over, similar to that found on most grooved axes. Because of these traits, this artifact is believed to be that of a Full Grooved ax. Occurrence of this implement in a stone bowl quarry might be expected, since worn-out specimens have been found in other quarries. Such finds were reported recovered from Virginia quarries by W. H. Holmes in 1892, while the writer has reported similar recoveries from the Westfield and Wilbraham quarries. Since then, this type of ax has been found in close association with Late Archaic remains at numerous local excavated camp sites.

SPECIAL FEATURES

Tool Cache (Fig. 2). At a depth of about $3\frac{1}{2}$ feet, 5 relatively large tools were found lying together, apparently undisturbed. As the property of some quarry, they may, accidentally, have become covered up, and in that way lost. There was no sign of a pit or underground cist of any kind to indicate they had been deliberately cached away. These tools consist of 4 picks and 1 chisel. As previously suggested, exhibits #1 and #3 may have been hafted, while the others have traits to indicate that they were held in the hand when in use. All show evidence of having had their bits ground smooth by stone abrasion, not as a result of continued use in the quarry. This fact, alone, places these tools in a class by themselves, and indicates special tooling by some workman, who claimed the outfit for himself. Probably, well made tools like this were conveyed back and forth to the quarry from the home camp. Frequently, broken specimens of like tools occur at quarry sites, but perfect specimens are almost never found. Therefore, this

recovery does much to confirm previous beliefs, that such well made ground bitted tools were the cherished property of certain workmen, who did not leave them at the quarry as a general rule.

Bowl-Form Ledge Remains. As excavation penetrated deeper into the tailings, evidence in the form of tools and semi-finished steatite products continued to appear. At length, when a depth of about 8 feet was reached, in one part of the area a steatite outcrop was encountered. Upon removal of fill in an effort to expose it to view, one partially finished bowl-form after another began to emerge, until three were uncovered. They were still attached to the ledge, and lay relatively close together. Their shape was the usual oval form common to most bowls, but the formation of end lugs had not taken place at this preliminary stage of development. Two of these bowl-forms, one measuring 11 x 22", the other 13 x 23" were undercut preparatory for removal; one was so deeply undercut that only a small connection to the ledge remained to be broken when the bowl-form was pried loose. Along with other evidence, here was proof that bowls were cut from steatite outcrops at this quarry, evidently during an extended period of time: an untold quantity of steatite had been worked away to a depth of 8 feet.

Stone Hearth and C-14 Date. Whenever a stone quarry is excavated, the question always arises, as to where the workmen lived. At the Ragged Mountain quarry in Connecticut, the living quarters were in the quarry, itself, for at that site, steatite outcrops had been worked away within a commodious rock shelter. This was made into a lean-to abode for the workmen and their families. At the Oaklawn quarry in Rhode Island, evidence indicated that at that site the quarriers camped about the periphery of the workings. Here at the Horne Hill quarry, small amounts of charcoal were encountered at three different upper levels, not all in the same part of the quarry. However, these seem to suggest nothing more than a casual fire here or there for some temporary purpose. At greater depths, no further charcoal remains occurred until the 7 foot level was reached. At this depth in square B3, a well formed stone hearth containing considerable charcoal was located. It consisted of 4 medium sized firestones, placed so as to leave an opening in one side, probably for feeding the fire. Within this opening appeared a well made End pick. The overall outside diameter of the hearth measured about 1 foot. This might lead to the conclusion that the 4 firestones were used to support a stone bowl. The writer uncovered similar hearths at Ragged Mountain just outside the rock-shelter abode of the quarriers, where contributing

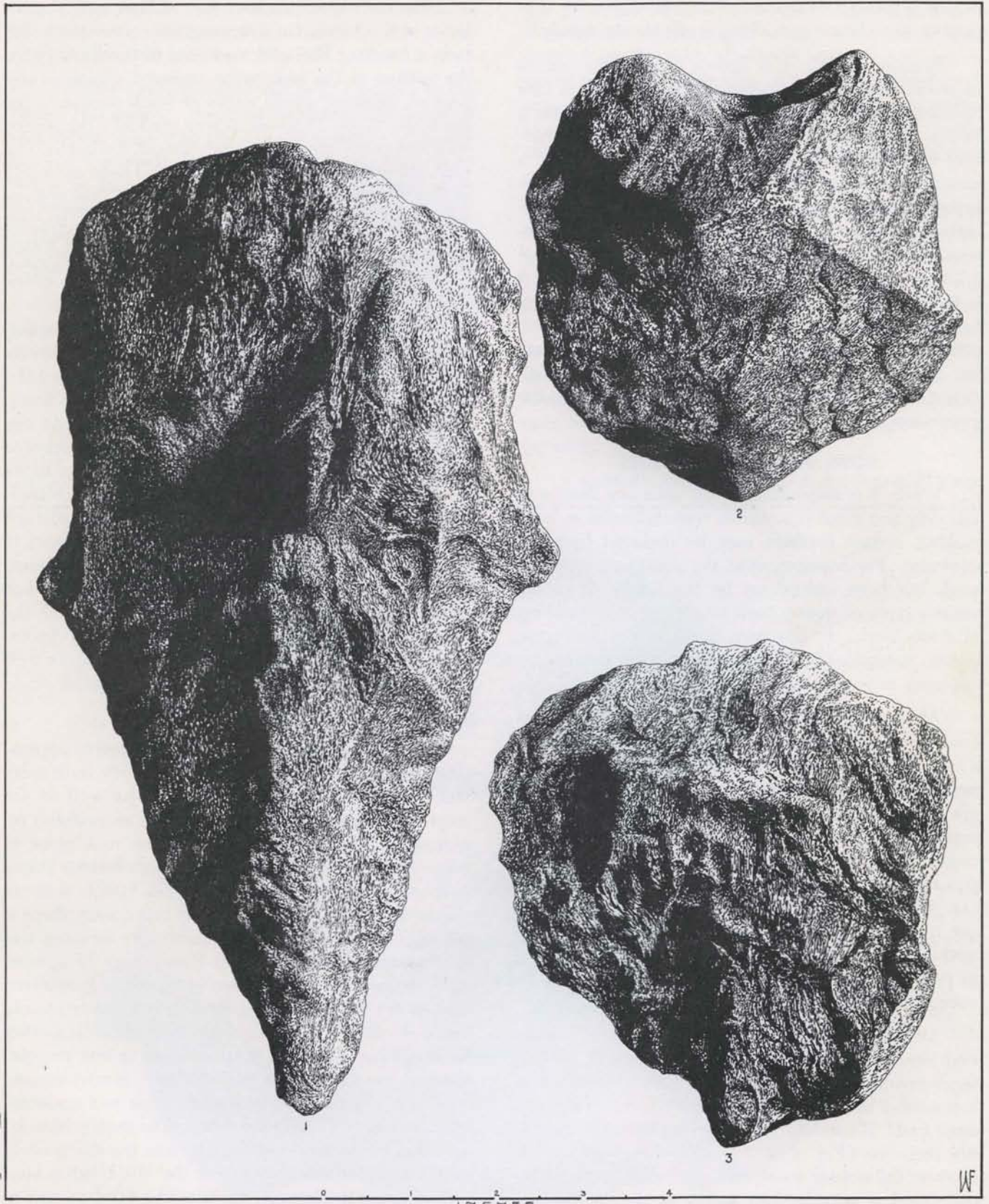


Fig. 3. TAILING-REMOVAL TOOLS, Horne Hill Quarry. 1, Spiked Tailing-Breaker; 2, Triangular Tailing-Breaker; 3, Hand Spade.

evidence pointed to the use of hearth stones for supporting stone bowls in cooking meals for the family.

Because of this, the finding of a stone hearth *in situ* at the Horne Hill quarry seems to take on new meaning. It may indicate that at one time, at least, a family of quarriers used the site as a shelter. Whatever hypothesis may be derived from this hearth, a sample of charcoal from it was preserved for radiocarbon dating. Word just received from the radiocarbon laboratory of Yale University reports that processing of this sample (Y-1399) yielded a measure of $2,730 \pm 120$ years ago. This is significant because it is the first radiocarbon date obtained, to the best of our knowledge, from charcoal closely associated with stone bowl quarrying in New England. As this date has much to do with overall evaluation of the evidence, further reference to it will be reserved for the conclusion.

BOWL MAKING TECHNIQUES

While it is impossible to say with any degree of certainty just what procedures were followed in bowl making, certain methods may be deduced from the evidence. Furthermore, over the years, experimental work has been carried on by the writer, in which various types of quarry tools were used in the making of stone bowls. In this way, through trial and error, certain operations have become somewhat clarified, as applying to various tools.

At the start, in the making of a stone bowl, a bowl-form was pecked out on the steatite outcrop with a relatively large End pick. This followed preliminary removal of unworkable stone material, such as impure granite and steatite schist, with large quarry picks and mauls. After pecking away a quantity of steatite surrounding the bowl-form to a desired depth, an End pick made from a relatively thin stone block came into use. With this the form was undercut enough, to permit it to be pried loose from the ledge. Often, this operation resulted in disaster with the form splitting in two along the grain, which sometimes ran in an unexpected oblique direction.

After the bowl-form had been successfully quarried loose, the work of shaping began, with the exterior coming first. Generally, an End pick of a size determined by the size of the bowl being made was employed. However, for large bowls, as shown by site recovery (Fig. 4, #2), a Chisel was sometimes used on the outside to expedite the work. The writer uncovered a semi-finished kettle at the Wilbraham quarry, which had its exterior similarly shaped by chiseling; is now on display in the quarry set at the Springfield Museum of Natural History.

The next operation was that of hollowing the interior of the bowl. Commencing from a relatively flat face, a finishing End pick was used at the start. Often the outline of the area to be removed was carefully pecked, allowing ample width of stock to remain for the bowl's edge. This outline was gradually deepened, with the pick's thrust directed toward the center. In time, the central lump of stock that had been encircled in this way was undercut and removed. This process was repeated until a depth had been attained, beyond which, judgment dictated that more pecking might cause breakage. At this point, scraping techniques were employed.

In removal of the rest of the interior by scraping, several tools were used, depending upon the ingenuity of the worker. At most quarries in New England the Hand gouge — perhaps the forerunner of the scoop chisel — was well developed and in use. At the Horne Hill quarry, however, well-defined specimens of this tool were absent, although several large flakes of hard stone appeared to have some resemblance. This tool seems to have been intended more for shaping small, rather than large bowls, and is believed to have been used to gouge out interior areas roughened by pecking. This hand gouging was supplemented at times, especially in the case of larger bowls, by the process of scraping with the Abrading-scraper. Apparently, this tool was used with both a sawing, as well as a scraping motion, for in this way the stock could have been more readily worked away.

By now the bowl had become hollowed to approximately the required depth, but the bowl's walls were still quite thick. For drinking cups, as well as for most bowls, thinning of the walls was an essential requirement. Presumably, this operation took place at home camp sites in most cases, although there is ample evidence at some quarries, as at Horne Hill, to indicate partial thinning at the source. At this quarry there is evidence to suggest that this preliminary scraping was accomplished with unshaped large flakes of igneous stone. However, at some quarries there is a specialized tool in evidence, classified as a Shaver. It is usually made of white quartz, but could be made of any other hard igneous material. It has a more or less straight, thinned razor edge, one end of which is intentionally rounded — sometimes both ends. This tool undoubtedly was used to pare down the walls from within by scraping, the rounded end fitting into the sharp curve of the bowl's bottom edges. At the Westfield quarry, this effective implement was first identified as part of the recoveries from an adjoining white quartz tool quarry and workshop. Since then, it has appeared in the workings of other stone bowl quarries, but to a

lesser extent. This may indicate that when made at the quarry, this tool was taken home for use in the final finishing of bowls.

Another less noticeable tool is in evidence at the Horne Hill quarry: the Abradingstone. Doubtless, it was useful along with the Abrading-scraper in roughing out the bowl's interior. It came into play in all stages of semi-finishing, as well as in the final stage performed at the home site. For this final finishing, workmen may have used a sandstone pebble to complete the work of smoothing the interior, and sometimes the exterior as well. Evidently, the extent of shaping and finishing to which a product was carried depended as much upon the artisan's temperament, as upon his skill.

QUARRY PRODUCTS

Finally, in considering evidence from this site's quarry workings, the report would not be complete without a study of the stone products left behind by

the quarriers. Most of these relics occurred in broken semi-finished fragments, or whole, in an incompleting stage of development. However, enough evidence remains to furnish some idea of how the finished products may have looked. As at other quarries, a varied assortment of eating utensils is represented in the assemblage, including bowls of various sizes, drinking cups, platters, plates and dishes.

Of the bowls, one well shaped specimen with two lugs was recovered (Fig. 4, #2). As pointed out before, its exterior has been entirely shaped by chiseling. However, its interior has been hollowed by pecking. It has reached the stage in its development, when scraping would have been employed, and might well be ready in its present state for removal to the home camp for finishing; is now on display at the Bronson Museum. Besides this bowl, many fragments of broken ones were found in the tailings, including numerous lug ends.

A partially completed deep dish (Fig. 4, #1) was

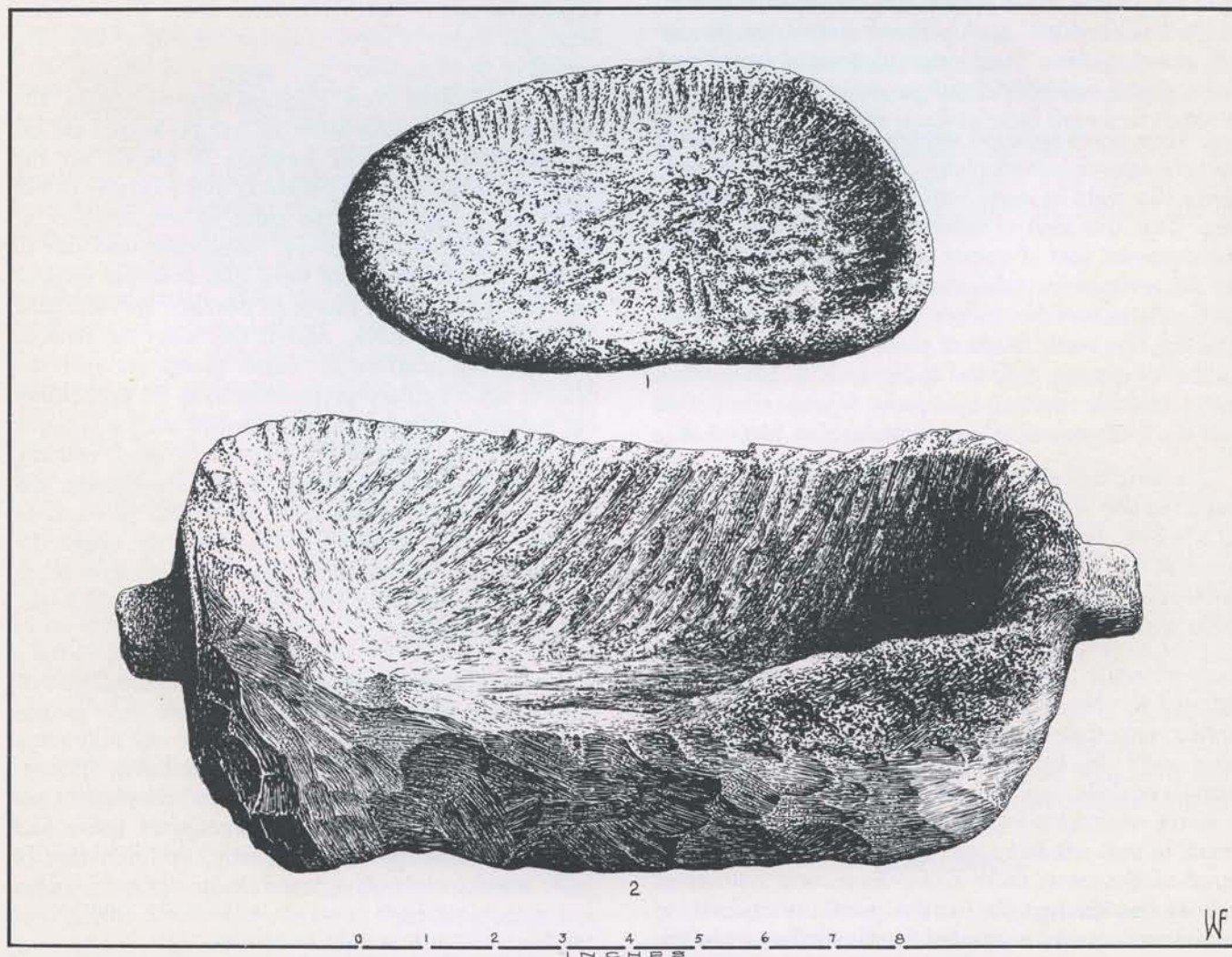


Fig. 4. SEMI-FINISHED STEATITE PRODUCTS, Horne Hill Quarry. 1, Dish; 2, Bowl.

among the recovered products. It shows shaping by pecking both inside and out. It, too, had reached the point when scraping would have followed. Like other specimens in this class of vessels, it has no lugs; might well have served when completed as a serving dish. Another deep dish without lugs, more nearly finished by scraping, appeared at the Wilbraham quarry.

Drinking cups were a necessity during this industrial age, if people were to partake of the liquid foods made available by the production of stone kettles. At the Horne Hill quarry, one partially hollowed out one appeared, as well as several cup-forms, apparently intended for this drinking utensil. Besides these and a semi-finished fragment or two, no other evidence appeared of this small utensil. Doubtless, countless numbers had been successfully manufactured and removed to home camps.

Evidence from the site indicating the making of platters, occurred in the form of semi-finished fragments, and about two thirds of one platter, which had split lengthwise. This platter, to judge from the form, might have had but one lug at one end, although usually they have two. Evidently, this kind of utensil was not a popular number at the quarry.

Then, there occurred steatite worked forms, which had the appearance of plates. They consisted of relatively thin slabs of stone with no suggestion of hollowing. That this kind of utensil was made, and formed an important part of quarry products has been proven by its presence at other quarries and camp sites as well. Plates may be oval or nearly circular in shape, and are frequently made of slabs of granite schist, as well as of steatite, as found at Horne Hill. Their edges are noticeably worked by coarse flaking, often with just the four corners of a rectangular slab lopped off.

Among miscellaneous nondescript steatite remains occurred one worked form, which had the appearance of a spoon. It was elongated in shape with a worked knob at one end, suggestive of a handle. Also, there were other chunks of steatite, some of which may have been the start of a planned product. However, none had reached a shape that suggested any particular utensil. With the knowledge that pipe making was carried on at certain other quarries, these chunks of steatite were carefully scrutinized for traits to indicate they were pipe blanks, but none seemed to have the required characteristics.

CONCLUSION

At this Bramanville steatite quarry, several observations seem to be suggested by the evidence. In the first place, the larger tools of the quarriers appear to

be well made for the most part, as is usually the case at other New England stone bowl quarries. However, in the department of small scraping tools, few if any appeared. Apparently, the workmen preferred to get along without them. Perhaps, they had not accepted them as desirable implements, instead, had used sharp edged hard stone flakes for what little finishing was done at the site.

Another thing to be noticed is the quality of steatite, which appears to be a little above average, if anything, and must have served the workmen well, for the various articles manufactured. However, there appear occasional iron impurities in the stone, which tend to weaken those areas where found. As in the case of the recovered bowl (Fig. 4, #2), such an iron impregnated spot weakened the stone through oxidation, and caused a segment of the rim to break off. This may have rendered the vessel useless, fit only for the discard.

As far as operation of the quarry is concerned, the cavernous main opening, if once filled with steatite outcrops, seems to support an estimate of a very long period of bowl making. This appears in keeping with evidence at other New England quarries. Also, the extensive tool remains attest to this prolonged period of operation. Whatever estimate is placed on the duration of the industry, there is every reason to believe that it represents the chief industrial effort of the Late Archaic. Moreover, considering the use to which the bowl products were put, it seems evident that the industry did much to advance the standard of living of those days. And, if this were the state of the economy, warfare in which group survival depended upon military preparedness, in all probability did not exist. Minds, directed toward such a creative manufacturing effort as that of stone bowl making, could not have been diverted by tribal in-fighting and have continued to produce the diversified products as shown by the evidence. Therefore, it might be assumed that warfare came after the making of stone bowls had ended; the two activities, it would seem, are not compatible.

From this reasoning, we must conclude that during the long Late Archaic period people were peace-loving individuals, who were unconsciously improving their condition through inventive productivity. Doubtless, population increase was slow, and people had not multiplied to a point when formation of tribes had become a necessity. Consequently, extermination of one's enemies through military action was not a factor in human survival.

While evidence from this quarry does not in itself

prove what division of labor, if any, existed between the sexes, comparative evidence from other sources does. It now seems apparent that the whole family trekked to the quarry, where they must have lived in straightened circumstances until their work of quarrying had been accomplished. That women participated in the labor is proven through typological comparison of their agricultural tools that followed with tailing-removal tools of the quarry. Similarity is so evident between Triangular hoes and Triangular tailing-breakers on the one hand, and Corn-planters and Spiked tailing-breakers on the other, as to leave little doubt as to their relationships. With the quarry established as the probable source from which agricultural tools developed, there is reason to believe that women were held responsible for removal of quarry tailings. While this generalized conclusion refers to conditions, which may not have pertained at every quarry, the probability is that they were of usual occurrence, and might well have existed at Horne Hill.

After reaching these conclusions, receipt of the Carbon-14 date, previously mentioned, of about 2,730 years ago has presented still another piece of evidence, from which thought-provoking conclusions may be drawn. While this charcoal measure indicates only one moment in the quarry's existence, fortunately, its source lay deep enough to serve as a convenient base from which to estimate the life span of the quarry. In the first place, it is self evident that the date represents an age long before the quarry closed down, since its charcoal sample from the stone hearth was buried by 7 feet of quarry tailings. And in addition, considering the fact that this level was 1 foot above the lowest level of quarrying, it might be argued further that work had been going on for a great many years before the hearth was laid down. That is to say, the time required to quarry away 7 feet of steatite outcrops, which may have covered the hearth level in the beginning, must have been considerable, as measured by the slow hand-pecking labor of those times. Therefore, a fair estimate might seem to place the Carbon-14 measured date somewhere near the middle of the quarry's life span. With this in mind, it is important to establish the approximate date when stone bowl making came to an end in New England.

This is believed to have happened with the coming of ceramics, when clay pots replaced stone bowls as cooking vessels. At Sweet-Meadow Brook site in Rhode Island, a Carbon-14 date of about A.D. 1000 represents the end of Stage 1 pottery making. This has enabled a reliable estimate of the start of ceramics to be about A.D. 300. From this, it may be seen that the Horne Hill date indicates continuation of bowl

making for about 1,000 years up to the closing of the quarry. To this, another 800 to 1,000 years probably should be added, representing the elapsed time required from the opening of the quarry, for removal of the 7 feet of steatite outcrops down to the level of the hearth. Here then, for the first time in New England is evidence of a reliable kind to indicate that stone bowl making lasted for about 2,000 years. This would place the start of quarry operations about 4,000 years ago, somewhat later than the Wapanucket 6 Carbon-14 date of 4,300 years ago. The Horne Hill dated estimate suggests the probability that Wapanucket 6 represents an early stage of the Late Archaic, when bowl making was nonexistent.

The writer is well aware that this evaluation runs contrary to the professional concept, that the stone bowl industry represents but a scant 500 year span, labeled Transitional, squeezed in between the Archaic and Ceramic culture periods. However, this new radiocarbon evidence seems to put an end to any such beliefs. Instead, it supports a much longer span of operations, more in keeping with former estimates. It now seems clear that stone bowl making should be considered a dynamic cultural influence, which must of necessity have done much to mold the social customs of the day. For no industry like this, effecting the welfare of all families over such a long span of time, could fail to leave its mark upon the cultural life of the people.

This new radiocarbon evaluation does much to confirm the hypothesis that stone bowl making was the most significant economic force of the Late Archaic, and extended over much of the period. Further, logical reasoning might place the start of the age at about 5,000 years ago, when new people from the Great Lakes area were arriving. But, since they came in small family groups on different occasions, covering many years of occupation, a long time must have elapsed before stone bowl making was conceived. According to this new estimate, 1,000 or more years might well have been consumed in getting settled, and in consolidating a slowly growing population. During this time there doubtless existed only a simple food gathering economy. However, this would not bar the probable existence of established religious rites, which may have come with these new arrivals. They may have served as an important cultural impulse during the first several hundred years of occupation. Finally, when discovery of steatite came and the idea of stone bowls was conceived, many years more would have been required, in which to create and perfect the different specialized tools, before bowl making could have prospered.

Before closing this report, notice should be taken of the absence at Horne Hill of stone pipe-making evidence. Neither pipe-blanks nor pipe-forms of steatite appeared to indicate the presence of this activity. Furthermore, the Pipe bowl reamer was not among the tools recovered. When this tool trait appears at quarries, even though pipe products are absent, it is considered probable that pipes were being made. But failure of both to occur seems to be conclusive proof of the total absence of pipe making. To find the answer for this negative condition that exists at Horne Hill, it may help to refer to a radiocarbon measure of charcoal, closely associated with stone pipe-forms at the Oaklawn quarry in Rhode Island. The Carbon-14 date of this feature is about A.D. 731, which refers to a period of time after termination of stone bowl making. This seems to indicate that the advent of pipe making came toward the close of bowl making, rather than at its start, and the negative pipe evidence at Horne Hill now appears to support this belief. It suggests a conclusion that this quarry may even have closed down before pipe making arrived. Based on this probability, stone pipes may not have been made during stone bowl times — at least, not until the final days of quarrying,

at the most. From this it may be safe to speculate that, for the most part, pipe makers of early Ceramic days reopened only some quarries in their search for steatite and chlorite. Apparently, there were quarries such as that at Horne Hill, which, for some unknown reason, were skipped, while others with only scant pipe evidence were used just occasionally. Oaklawn, alone, appears to represent extreme concentration of pipe making; may actually have been the center of this later industry.

From this review of the evidence, it now seems clear that the Horne Hill quarry excavation has done much to furnish valuable evidence, enabling a more complete understanding of the stone bowl industry. Among other things, it has focused attention upon the significant contributions made by the quarriers, in advancing a higher standard of living by providing permanent eating utensils for consumption of liquid foods. And it has made the probability more convincing of a Late Archaic period of long duration, inspired by stone bowl industrial activity.

Bronson Museum
October 20, 1964



A WING ATLATL WEIGHT FIND

KARL S. DODGE

Shores of lakes have always been a fruitful field for surface hunting, especially when the water level is low with shallow areas previously covered with water returned to dry land. In the fall of last year a long drought had lowered the water in most lakes, so the writer thought it a good time to search lake shores, where formerly he had found many fine points and other artifacts. Bowdish Reservoir, the place selected for hunting, lies in the northwest section of Rhode Island near the Connecticut state boundary line. The waters from this lake empty into a Connecticut water course and thence into the Sound.

On the day of this find, the water level in the lake was quite low, and its sun-baked shores were

exposed to view far out into the lake. The silty floor, washed by heavy rains had become dried from long exposure, so that stones stood out in full view. This provided favorable conditions for surface hunting. After walking around the shore for a short distance a promising looking worked piece of quartzite was flipped over by the writer's walking stick. On examination it was found to be a T-base drill (Fig. 5, #1). It was lying close to a piece of worked stone, which had a small hole drilled through it. This proved to be the upper wing section of what appeared to have been a Wing atlatl weight, with half of its centrally drilled area exposed. The small perforation through its wing seems to indicate an effort had been made to repair a break. Soon, other parts of the wing were found lying

near the first. With about half the weight recovered, a more extensive search was made in hopes of finding more of the artifact. This effort was soon rewarded by the appearance of four or five more smaller fragments, which together with the other pieces accounted for almost three-quarters of the atlatl weight. The two segments last found, each had a small hole drilled through the wings, apparently for the purpose of strapping the broken artifact together with thongs. A subsequent return to the site at a later date in hope of finding the missing sections was unrewarding.

After these finds had been taken home and cleaned, an important discovery was made. The bit of the drill was found to fit perfectly into the three drilled holes previously referred to, which were all drilled from the same side of the implement. Not only this, but one of the minute prongs from chip removals toward the end of the drill's bit fitted exactly a circular ridge left near the top of each perforation. This seems to be indisputable proof that the drill had been used at this site in an attempt to repair the broken weight.

Afterwards, it was discovered that most of the broken segments were contiguous, and a restoration of the atlatl weight appeared feasible. So, they were taken to the Bronson Museum, where restoration has been effected (Fig. 5, #2). It will be noted that the wings of this weight extend vertically, in the same direction as that of the central perforation, rather than horizontally. Since no specimen exactly like it is shown in the Wing atlatl weight category of the Society Classification, the writer thought it advisable to present the circumstances surrounding the find.

Besides the facts as written, another piece of information is necessary to confirm the classified position of this artifact as a Wing atlatl weight. A significant feature is that it is made of steatite (soapstone). Now, it has been proven that steatite was never used for artifacts until the Late Archaics opened the quarries for the making of stone bowls. Therefore, this atlatl weight could not have been made by the Early Archaics, who preceded the Stone Bowl Makers. Consequently, it must be a Wing atlatl weight, which is a diagnostic of the Late Archaic, although the wings extend in the opposite direction from that customarily

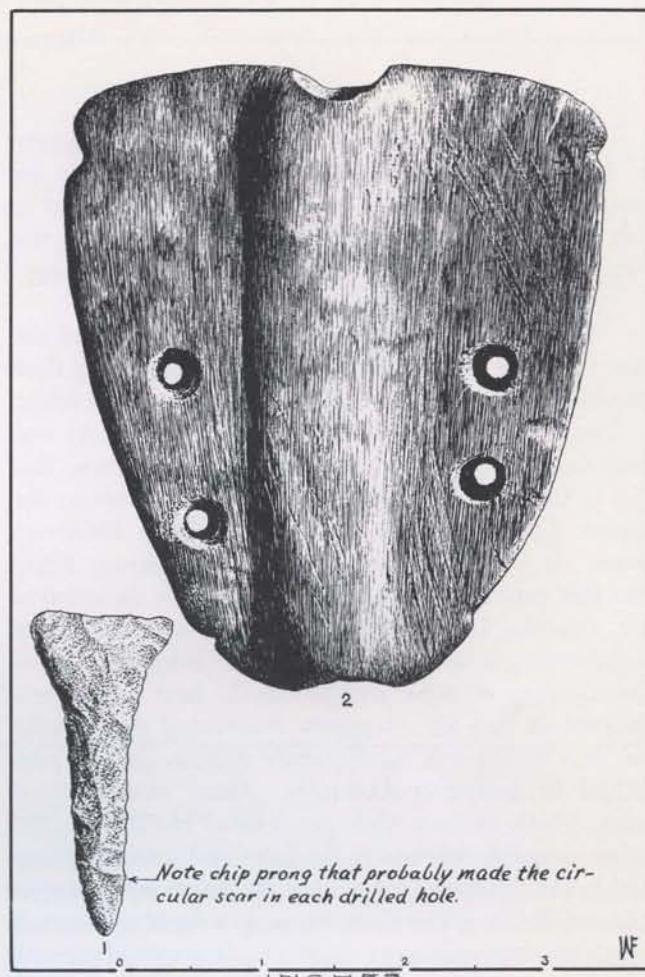


Fig. 5. BOWDISH RESERVOIR RECOVERIES. 1, T-base Drill; 2, Wing Atlatl Weight (restored).

found in atlatl weights of this type. It remains but to add one more proof of this culture association. This is based on a supposition, which seems plausible. If the T-base drill was used in repairing the weight, as the evidence seems to indicate, then this provides added proof to suggest the Late Archaic is the period represented by the Wing atlatl weight, of which this type of drill is held to be diagnostic. In further support of this deduction, continued hunting was successful in the recovery nearby of a dozen or more projectile points, all exhibiting types of the Late Archaic, as shown by illustrations in the latest point classification of the Society's Bulletin, Vol. 25, No. 1.

Greenville, R. I.
January 1964



THREE IROQUOIS POTS FROM NEW JERSEY

WILLIAM S. FOWLER

The writer is indebted to Dr. Lewis M. Haggerty of Hackensack, New Jersey, who made available for restoration sizable portions of three pots described in this report. They occupy an important place in the comparative analysis that is discussed further along.

First, it may be well to review the source of the first two pots and the circumstances surrounding their recovery. According to information received by letter, it appears that back in April, 1945, Dr. Haggerty was surface hunting on the Kron Farm in New Jersey. This lies in the northern part of the state at Flatbrookville, Sussex County, on the east bank of the Delaware River. It was here in 1938 at the Rosenkrans Ferry site that excavations were made under the direction of Dr. Dorothy Cross. Many potsherds were recovered representing a late ceramic epoch of Iroquois times—*Archaeology of New Jersey*, Vol. I. And it was here in 1948-49 that Dr. Haggerty discovered the Middlesex site, which was subsequently written up and published in *American Antiquity*. Along side of these sites, which lie on a high promontory overlooking the river, runs the old road to the ferry and a small spring-fed brook. Just beyond toward the north are extensive plowed fields of the Kron Farm, in which appear two small plateaus, one near the river. At a spot about half way between these two elevations, discovery was made of the larger pot (Fig. 6, #1).

Freshly broken potsherds were noted in this part of the field, which seemed to indicate recent disturbance, as though they had just been plowed up from a lower deposit. Test pits were then dug in several places, especially where slightly discolored spots were observed. Possibly, these were contents of refuse pits, which the plow had redeposited on the surface. Resting beneath one of these darkened deposits, many sherds were encountered. Upon more careful investigation they proved to be all from one vessel. And after weeks of assembling, they were found to form a large part of the collar of a castellated pot, as well as a portion of its neck and body. It was quite apparent that the pot was well made and meticulously decorated, mostly on the collar, with an intricate incised design that completely covered it. While it was possible to restore the collar by cementing the contiguous sherds together, it soon became clear that a complete restoration of the pot would require assistance from some qualified source.

While this problem was still unsolved, another recovery was made on July 18, 1948 by Dr. Haggerty,

which perhaps overshadows the first. About a couple of miles up river toward the north from the Kron site, another plowed area has produced much evidence of occupation. It is known as the Bevans Brothers site, or the Biessler site, as it is now called by the Archaeological Society of New Jersey. The State has tested the site within the last two years, as it will be covered with impounded water when the Tock Island Dam is completed. Plowed fields cover a huge area of river flats at this location, and here extensive evidence of prehistoric occupation is noticeable. Just north of the area tested by the State, across a dirt road that runs down to the river, is a slight elongated elevation. Here, as well as on another rise of ground nearer the river rich deposits of artifacts have been noted, so that surface hunting of these areas has been most rewarding. On the day previously mentioned, a search was made of the elongated elevation. Potsherds were noticed in one area and a few darkened spots of ground recently left by the plow. After excavating two or three of these small areas, another accumulation of sherds was uncovered. They appeared to belong to a smaller pot than the first, as they were more curvate in appearance. When they had been dried and cleaned, many were found to be contiguous. After a long struggle, all but one castellation of the collar section was restored. But there remained many neck and body sherds, which defied all efforts to join them together. However, it was readily seen that most of them belonged to the same vessel, of which perhaps all but a quarter had been recovered. Again, it was another castellated collared pot, but with an unusually high collar, deeply incised with a well-ordered design. But what seemed of added importance were three broad linear bands running around the body below the neck. These were joined together by oblique linear connecting bands opposing each other (Fig. 6, #2).

Here again, final restoration of the pot depended upon outside help of someone skilled in this particular field. Years later the problem was belatedly solved when the work of restoration was entrusted to the Curator of the Bronson Museum. It has now been accomplished with the results as shown by the illustrations.

COMPARATIVE ANALYSIS

Both pots from the Kron and Bevans Brothers sites appear to be castellated collar vessels of the Iroquoian epoch. Number one with five castellations is outstanding with double bands of interrupted in-

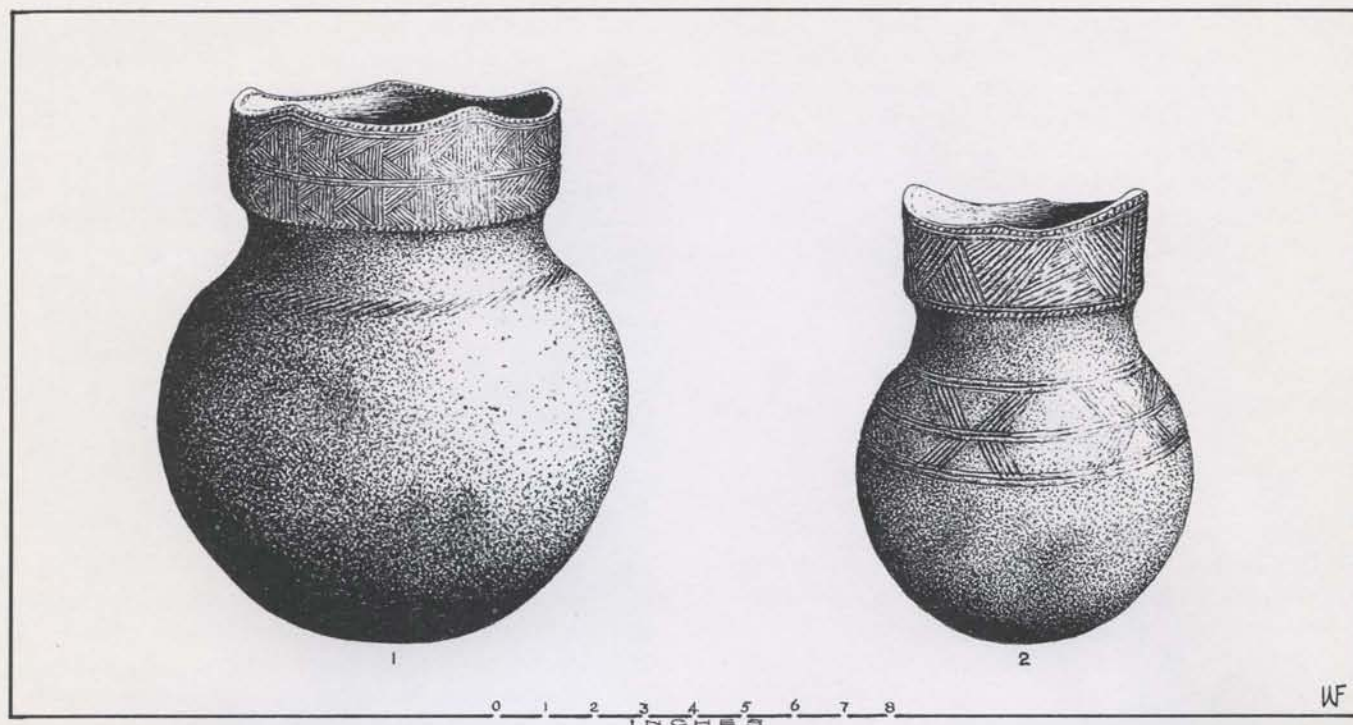


Fig. 6. IROQUOIS POTS (restored), upper Delaware River Valley.

verted chevrons incised over the entire collar. However, it should be noted that the lower band has the chevron motif only between two castellations, shown in front in the illustration. For the rest of the distance around the collar, the lower band changes into a continuous herringbone motif.

Pot number two has four castellations, but with the unique variation of two low ones being spaced equidistant between two high ones. A relatively wide collar is covered with an evenly incised chevron design motif with vertical linears at the two high castellations, cut in their center by a ladder of cross bars. One irregularity may be noticed in front, wherein the chevron sequence is interrupted by a more oblique slant to the linear fill-ins, used to compensate for the error. Of unusual occurrence is the wide three linear incised design that encircles the body, as it lends a note of distinction to the pot. Both vessels have beautifully constructed full globular bodies with tool-smoothed surfaces inside and out, and the paste of each has fine mineral temper. Without doubt they belong among those ceramic recoveries from this northern section of New Jersey's Delaware River Valley, considered by Cross either to have Iroquoian affiliations, or to be actual products of Iroquois potters.

Turn now to New England where Stage 4 pots have Iroquoian-influenced traits; were evidently contemporaneous with Iroquoian ware. It should be ob-

served that whereas Iroquois pots are almost always found to have full globular bodies similar to those illustrated, Stage 4 pots of New England have semi-globular ones instead; almost never are full globular. Both types of pots have castellated collars with a prominent undercut neck. However, while the Iroquois designs are usually well ordered with only a few errors or inconsistencies, those found on most Stage 4 pots rarely appear so evenly engraved. Instead, they have more irregularities of design work with often one motif conflicting with another, as if the potter was not too sure of the exact design she was trying to incise in the clay.

This observation seems to this writer to indicate a movement of ceramic ideas into New England from culture centers outside. Quite obviously here, an effort is discernible of New England potters trying to copy the superior workmanship of Iroquoian artisans. But as they labor they are apparently hindered in their efforts by an independent creative urge, inherent in all human beings. Also, they seem to be hindered by inability to break away from the traditional conoidal style of pot. Doubtless, they were still using the old method of placing the pot in hot embers with stones about it as props, for which a more or less pointed base would have been useful as a support. Whether the Iroquois followed the same method or used a tripod suspension because of their rounded base pots, is unknown.

These differences between New England Stage 4 pots and those of the Iroquois suggest the deduction that New England potters, isolated to some extent as they were from outside culture diffusions by a high mountain chain and water barriers, were still slaves to their traditional past. Because of this they probably resisted change to new pottery styling, in which, influences were pressing in from outside culture areas.

Bronson Museum,
January 1964

APPENDIX

Since writing this report, Dr. Haggerty has made available for restoration many sherds from a third pot, which deserves notice because of several unusual features its restoration displays (Fig. 7). However, before discussing them it might be of interest to note that in the process of restoration the collar was found to be completely joined by contiguous sherds. Also, enough of the body and neck sherds were present to form contiguous connections with a full globular base, that was intact. Therefore, a perfect restoration of the pot's original shape was made possible, as also may be said for the other two pots described in this paper.

From a recent letter received from Dr. Haggerty, it appears that this third pot was recovered by him from still another Delaware River site other than those previously mentioned. It is known as the Marvin site, and it rests on a plateau, elevated high above the river at a spot about half way between Milford, Pa. and Port Jervis, N. J. Evidently, during its occupation in early days, it had been a choice site because of its location at a bend in the river. On various occasions in more recent years, it appears to have been flooded, with much silt accumulation resulting. This seems to have buried camp refuse and artifacts at depths out of reach of the plow for the most part. As a result, surface hunting of the area has never been too rewarding.

In early March of 1950, Dr. Haggerty visited the site again and was startled at what he saw — the place was scarcely recognizable. The top soil to a depth of 10-14" had been removed by a power shovel to provide top cover for a new golf course. But what attracted his attention most was the concentrated stone and charcoal remains of 40 or 50 hearths, which had been exposed by the shovel. Some of them were practically intact, while others were badly disturbed. Such an archaeological outlay was quite an impressive sight, since soil erosion from melting snows and spring rains had brought the hearths' outlines into sharp relief.

During that summer, Dr. Haggerty carefully excavated about 30 of these hearths, but without much luck, except in the case of hearth #4 as described below. In a number, only about one or two inches of the base of several pots were recovered. A search was subsequently made for their tops without success in the site's loam, which had been stored in a great heap several miles distant. However, in hearth #4 appeared a great many sherds, which seemed to belong to one vessel. They occurred mostly in relatively small pieces, but large enough to show that they were from a castellated pot with an interesting decorated collar. Besides these, there were a few sherds from several other pots — not enough for restoration — and 5 or 6 fragments of a short stemmed, heavy ceramic 3" long elbow pipe, since restored at the Bronson Museum, (not illustrated).

After restoring the pot from hearth #4, the writer was impressed with its beautiful proportions — a truly superior pottery accomplishment of the Ceramic Age. Besides this, he noticed it had certain marked characteristics, which seemed of sufficient importance to warrant special mention, such as could not be adequately covered in just a cursory enumeration of them.

First, that which quickly attracts the eye are the pot's six castellations. These are more than are usually found on pots of this kind, and their meticulous even spacing should also be noticed, as indicating skillful, careful work of the potter. While the collar is

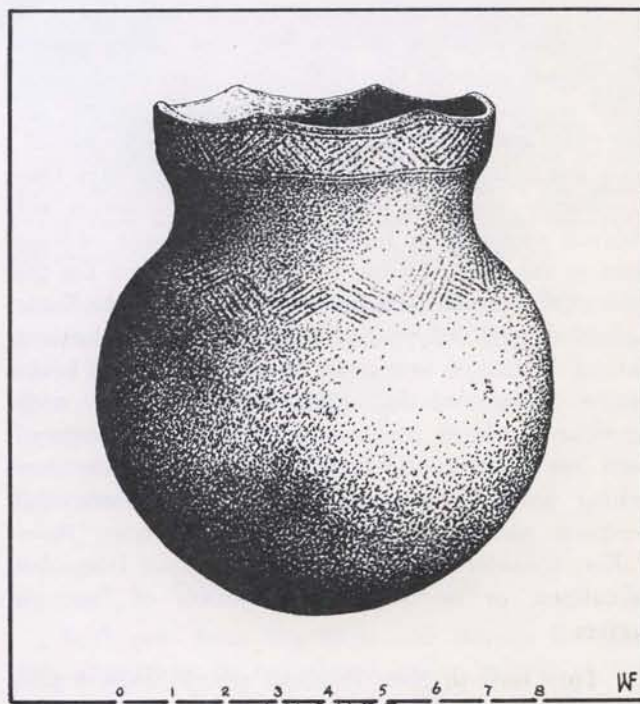


Fig. 7. IROQUOIS POT (restored), upper Delaware River Valley.

THREE IROQUOIS POTS FROM NEW JERSEY

quite narrow, it is proportionately offset by a wide and deeply constricted neck. But of especial interest is the filled-in chevron design motif on the collar. If this were worked by the incised technique, as in the case of the first two pots, similar to most Iroquois vessels, there would be no need to do more than call attention to it. However, in this case the technique is not incised, but is dentate impressed and is here referred to as line-dentate. That is, a toothed marker was pressed repeatedly into the clay, end to end, to form lines. In this instance, the marker was small, just short of $\frac{1}{4}$ " in length with 4 minute teeth. It was carefully impressed, so as to form uninterrupted lines of teeth marks. The same tool that stamped the collar design was used to work the chevron pattern on the lower neck.

Information from New York State sources indicates that this line-dentate technique is a manifestation of pre-Iroquoian Owasco pottery, which would seem, if taken at face value, to suggest an Owasco source for this pot. However, typologically, its full globular shape and meticulous workmanship seem to

imply a product of Iroquois manufacture — the ware is relatively thin, being drawn down to $\frac{1}{8}$ " in thickness in some places. It has fine mineral temper, and is so well fired that a plastic spray was not required to prevent crumbling. Therefore, one possible deduction might follow that this pot represents early Iroquoian ware, with suggested Owasco overtones of racial continuity.

At the same time, consideration should be given to presence of the ceramic elbow pipe, previously mentioned, which appeared in the same hearth with the pot. Because of this association, they should doubtless be considered contemporaneous. With this a probability, examination of the pipe's traits is essential. Its short stem and thick walled heavy bowl seem to suggest affinity to the Owasco pipe complex rather than to that of the Iroquois. The latter has more sophisticated styled forms, including such well-known types as the Trumpet pipe. If this is so, then the pot's position in early Iroquois times before Owasco traits had completely disappeared seems well supported.

